

# PERFORMANCE OF A NETWORK

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## ABSTRACT

In today's world, time is everything. The smallest delay could cause massive damage in the financial or materialistic sense, which in-turn has catastrophic results. For a business to run or play a game, one needs to be connected to the world via the internet. One of the significant delays caused while communicating via the internet is the message latency. In this paper, we are going to talk about the latency of the network, how it is calculated, and how to curb it. We are even going to simulate the message path and delays in it on single network line between 2 computers, using the virtual-lab platform, which helps other students to learn topics easily.

# INTRODUCTION

In today's world, maintaining distance is as crucial as how one manages their time, but that would cause problems like face-to-face education, where many students sit under one roof learning from one teacher. Hence, the government has issued distance learning, where every student can learn via the web, using the Virtual-Lab platform.

Hence, in this paper, we will talk about "NETWORK PERFORMANCE" using Virtual-Labs to make it easier for the student to understand the topic.

NETWORK PERFORMANCE, in other words, is the performance of the internet to get one's message in and out, with or without delay. It can be measured using multiple methods, but we are focusing on the primary process by the summation of all the delays, namely, Propagation, Transmission, Processing and Queue.

We explain this using a website, built primarily on HTML & CSS. The simulation is built using JavaScript but optimized to run smoothly on any browser and is hosted on Github.

## LITERATURE REVIEW

Computers in today's world are connected via the internet, and information is being passed every second when you google something or add a calendar notification or any process connected to the web. A computer connected to the internet can almost do anything. In this paper though, we are going to talk about the whole project in a virtual environment.

The virtual lab is nothing but a simulation built using HTML, CSS and JS. It is just a visual representation of what is happening. A message is sent from a transmitting device, which passed through the transmission medium, which is the internet and thus received by the receiver. It is a fully functioning website.

The simulation has multiple inputs for the distance, speed, bandwidth and packet size. The data is not processed using javascript, and then the simulation begins where the packet size is shown by the blue bar.

# DATA RESOURCES

## 1. Information Pages

The pages use HTML & CSS as the backbone for the structure; all images and text use media-query methods for their positions.

Fonts and forms are embedded in the website from w3schools.

## 2. Simulation

The page uses HTML & CSS as the backbone for the structure and javascript for the applet. It is a 1-1 computer connection; hence the complexity is low.

# METHODOLOGY

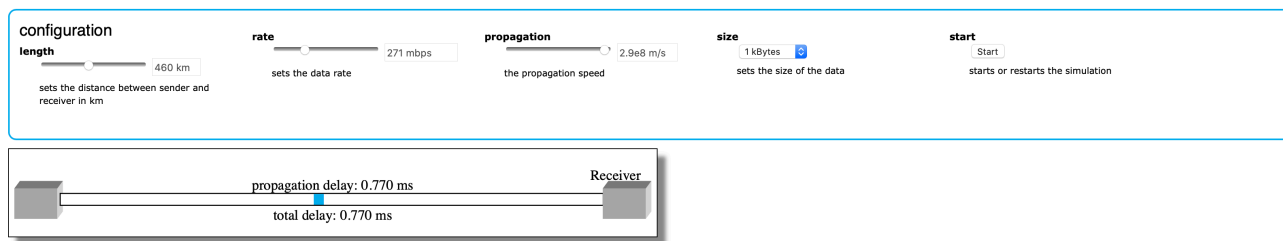
The first few data pages, are written testaments about latency. The main functional area of the whole package is the simulation. It works on basic javascript applets.

First the inputs are given, which are then taken by java script to calculate the end-result. The end solution is then sent to the css which convert it into animation, that is shown in the end.

# RESULTS

## SIMULATION

This animation illustrates the difference between transmission and total delay.



The blue bar, below the propagation delay is the packet size, it changes according to the bandwidth and packet size. Even the speed is relative.

# PERFORMANCE EVALUATION

The simulation works as intended to, it provides a comprehensive insight into the delays caused when trying to send a message between two computers.

# CONCLUSION

The virtual lab environment is a very good exercise to help students at long distances to easily understand a topic.

# ACKNOWLEDGEMENTS

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# REFERENCES

1. Youtube
2. Github
3. StackOverflow